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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/768,173	01/24/2001	Koh Fuwa	010062	9220
23850	7590	11/19/2003	EXAMINER	
ARMSTRONG, KRATZ, QUINTOS, HANSON & BROOKS, LLP			DEMAKIS, JAMES A	
1725 K STREET, NW			ART UNIT	
SUITE 1000			PAPER NUMBER	
WASHINGTON, DC 20006			2836	

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/768,173

Applicant(s)

FUWA ET AL.

Examiner

James A Demakis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Amendment of 8/29/2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 January 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kumar et al (5751537).

Regarding claim 1:

Kumar et al disclose a chuck equipment 20, with a bipolar electrode configuration for use in a non-plasma process containing: a plate-shaped base 80, first electrodes 146 and second electrodes 148 isolated from each other by insulator 30, first voltage power supply 110 comprising two DC power supplies that provide negative and positive voltages to the first and second electrodes, respectively, inducing opposing electrostatic charges in the substrate 35, thereabove, to electrostaticly hold to the chuck electrodes; see Figure 3, Col.6, lines 7-43.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2-4,6-7,12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar et al in view of Shufflebotham et al (USPN 5847918).

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Regarding claims 2-4,6-7,12-14:

Kumar et al teach all that is claimed, as discussed in the above rejection of claim 1, except for the exposed electrode surfaces contacting the substrate and flush with the base. Shufflebotham et al discloses the use of electrostatic chucks 30 as part of vacuum plasma processing equipments¹⁰, see figure 1, to clamp dielectric work-pieces consisting of a glass substrate, Col. 3, lines 52-53. The electrodes 36 and their bases 27 can be of various shapes, including circular 80 or "plate-shaped", see Figures 6 and 7, and Col. 9, lines 24-25; and are surrounded by an electrical insulator body 44, Col. 6, lines 14-16. Also, the electrodes include a bare upper metal planar face, which abuts the back face of the substrate work-piece, see Figure 2 and Col. 5, lines 39-40. Additionally, the electrodes can be modified to include a protective coating 59, Figure 4, that can be a very thin dielectric or an electrical conductor material, Col. 7, lines 25-30.

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Kumar et al with the teachings of Shufflebotham et al to have an electrode with an electrical insulator surrounding all surfaces of the electrode except portions of the planar face of the electrode facing the substrate to prevent the electrode from being in electrical contact with ions in the chamber and allow more uniformly applied electrostatic forces on the substrate.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar et al and Shufflebotham and in view of Kasahara (USPN 5229910).

Regarding claim 5:

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Kumar et al and Shufflebotham et al teach all that is claimed as discussed in the above rejection of claims 2-4,6-7,12-14, except for convexity within the arrangement of the electrodes.

Kasahara discloses electrostatic electrodes conforming to a concave/convex curvature structure, Figure 4(A), with electrodes 12a,12b and insulating structures 13 conforming to the main structure, see Col.5, lines 15-28. This results in a higher density of electric lines of force E from attracting layer 11 due to the curvature.

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Kumar et al and Shufflebotham et al with the teachings of Kasahara to allowing a curvature between electrodes and therefore increasing electrostatic forces, as a result.

6. Claims 8-10,13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar et al and Shufflebotham et al and in view of Kitabayashi et al (USPN WO 0072376).

Regarding claims 8-10,13:

Kumar et al and Shufflebotham et al teach all that is claimed as discussed in the above rejection of claims 2-4,6-7,12-14, except for the specified electrode spacings and electric field.

Kitabayashi et al discloses the use of a plurality of pairs of electrodes as shown in Figures 4-6. Additionally, it is disclosed that electrode spacings of 2 mm or less, Col. 11, lines 11-15; and electrode widths of less than 4mm are used. Using the voltage applied of 10 kV and a spacing of 1mm between the electrodes; an electric field of 1×10^6 V/m is obtained from this calculation, Col. 11, lines 11-27.

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Kumar et al and Shufflebotham et al to have allowed a curvature

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between electrodes thereby increasing the electrostatic force at the center of the curvature. Also, the modifications suggested in voltage, electrode spacing and width have the benefit of allowing sufficient electrostatic forces and providing for adequate spacing for insulation to prevent breakdown.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar et al and Shufflebotham et al and in view of Horwitz et al (USPN 5103367).

Regarding claim 11:

Kumar et al and Shufflebotham et al teach all that is claimed as discussed in the above rejection of claims 2-4,6-7,12-14, except the use of three electrodes.

Horwitz et al disclose the use of three electrodes 13,14,12 in a chucking device having different applied voltages, including the third electrode as reference or ground, see Col.2, lines 41-44 and Figure 4.

It would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Kumar et al and Shufflebotham et al with the teachings of Horwitz et al to use a third electrode as a reference electrode to minimize voltage gradients across the substrate surface and prevent electronic device damage caused by a breakdown of insulating layers on the wafer surface.

Response to Arguments

8. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Demakis whose telephone number is 703.305.7938.

The examiner can normally be reached on 7:30AM-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Sircus can be reached on 703.308.3119. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0956.

James A. Demakis
11/16/03



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